



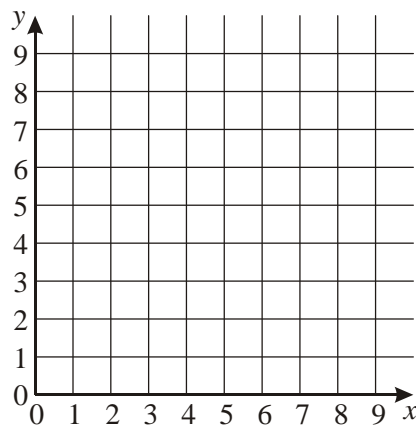
Name: \_\_\_\_\_

Answer the following questions :-

Marks: 35

1. A is the point (2, 3), and B is the point (4, 9).
- (a) Find the gradient of the line segment [AB]. [1]
- (b) Find the gradient of a line perpendicular to the line segment [AB]. [1]
- (c) The line  $2x + by - 12 = 0$  is perpendicular to the line segment [AB].  
What is the value of  $b$ ? [3]

2. The equation of a line  $l_1$  is  $y = \frac{1}{2}x$ .
- (a) On the grid, draw and label the line  $l_1$ . [3]

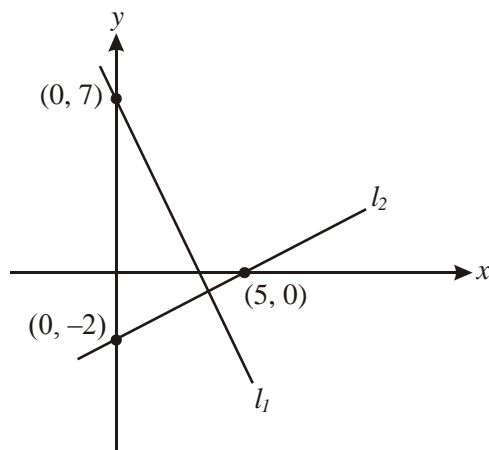


The line  $l_2$  has the same gradient as  $l_1$ , but crosses the y-axis at 3.

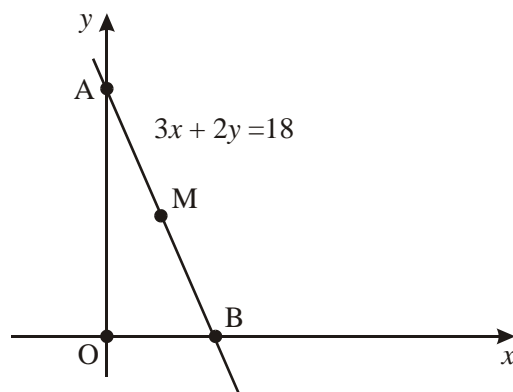
- (b) What is the geometric relationship between  $l_1$  and  $l_2$ ? [1]
- (c) Write down the equation of  $l_2$ . [3]
- (d) On the same grid as in part (a), draw the line  $l_2$ . [3]
3. The following diagram shows the lines  $l_1$  and  $l_2$ , which are perpendicular to each other.

**Diagram not to scale**

- (a) Calculate the gradient of line  $l_1$ . [2]
- (b) Write the equation of line  $l_1$  in the form  $ax + by + d = 0$  where  $a$ ,  $b$  and  $d$  are integers, and  $a > 0$ . [3]



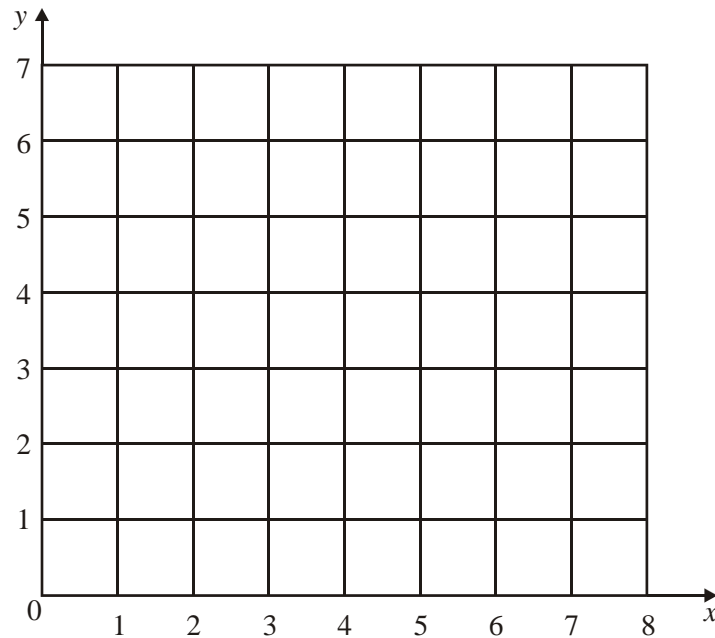
4. The diagram below shows the line with equation  $3x + 2y = 18$ . The points A and B are the y and x-intercepts respectively. M is the midpoint of [AB].



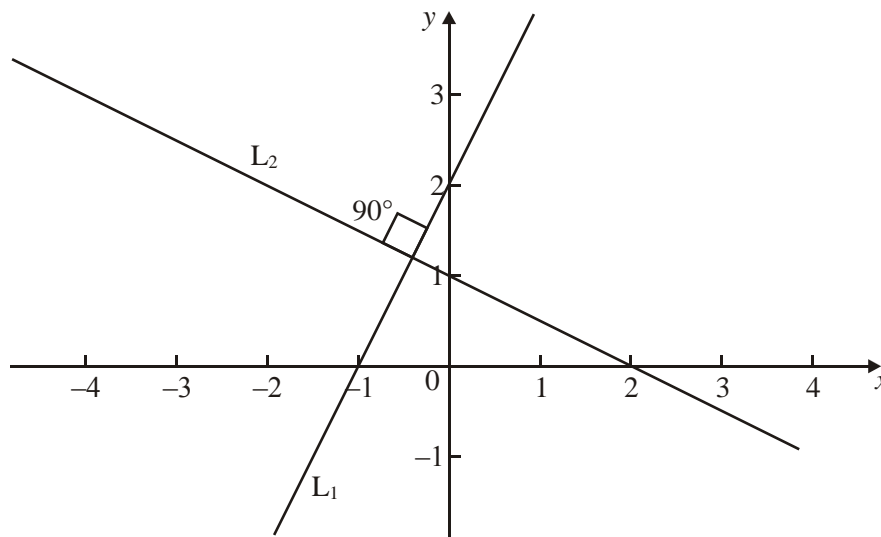
**Diagram not to scale**

Find the coordinates of

- |                  |     |
|------------------|-----|
| (a) the point A; | [1] |
| (b) the point B; | [1] |
| (c) the point M. | [1] |
5. Two points are given as A (4, 3) and B(5, 7).
- |  |     |
|--|-----|
| (a) Plot these points on the grid below.   | [1] |
| (b) Join the points with a straight line.  | [1] |
| (c) Calculate the gradient of the line AB. | [2] |



6. A student has drawn the two straight line graphs  $L_1$  and  $L_2$  and marked in the angle between them as a right angle, as shown below. The student has drawn one of the lines incorrectly.



Consider  $L_1$  with equation  $y = 2x + 2$  and  $L_2$  with equation  $y = -\frac{1}{4}x + 1$ .

- (a) Write down the gradients of  $L_1$  and  $L_2$  **using the given equations**. [2]
- (b) Which of the two lines has the student drawn incorrectly? [3]
- (c) How can you tell from the answer to part (a) that the angle between  $L_1$  and  $L_2$  should not be  $90^\circ$ ? [1]
- (d) Draw the correct version of the incorrectly drawn line on the diagram. [2]